

Serial No. 10/085,583  
Docket No. H07-139239M/MAK

2

**AMENDMENTS TO THE CLAIMS:**

1. (Previously presented) A two-dimensional beam writing position detecting device, comprising:

an optical system for scanning on a photoconductor by laser beams emitted from a semiconductor laser to form an electrostatic latent image and arranging a plurality of the laser beams in two dimensions and slantingly scanning the plurality of laser beams for forming the electrostatic latent image on the photoconductor at a predetermined angle (  $\theta$  ); and

a detector for detecting the plurality of laser beams for determining a first writing position of the plurality of laser beams on the photoconductor,

wherein a longitudinal direction of a light beam receiving surface of the detecting device inclines at the substantially same angle (  $\theta_1$  ) as the slant scanning angle (  $\theta$  ) with respect to the perpendicular of a scanning direction of the plurality of laser beams.

2. (Previously presented) The two-dimensional beam writing position detecting device according to claim 1, wherein the angle (  $\theta_1$  ) of inclination of the longitudinal direction in the light beam receiving surface of the detecting device is within a range represented by an expression:

$$\theta_1 = \theta \pm \tan^{-1} [\text{a beam radius} / (\text{P2} \times \text{a number of beams of a primary scanning direction})]$$

where P2 in the expression is a beam pitch of a sub-scanning direction.

Serial No. 10/085,583

3

Docket No. H07-139239M/MAK

3. (Previously presented) The two-dimensional beam writing position detecting device according to claim 1, wherein a length S1 of a laser beam sub-scanning direction of the light beam receiving surface of the detecting device is greater than or equal to a value in which a beam diameter is added to a value in which a beam pitch P2 of the sub-scanning direction is multiplied by [(a number of beams of the sub-scanning direction)-1], and a length S2 of a laser beam scanning direction of the light beam receiving surface is less than [(a beam pitch P1 of the scanning direction)-(a beam diameter)].
4. (Previously presented) The two-dimensional beam writing position detecting device according to claim 1, wherein the light beam receiving surface of the detecting device is partitioned and includes a slit.
5. (Previously presented) The two-dimensional beam writing position detecting device according to claim 1, wherein the light beam receiving surface of the detecting device comprises a photodetector.
6. (Currently amended) The two-dimensional beam writing position detecting device according to claim 1, wherein a signal, which represents of a scanning direction beam of a first row ~~or a plurality of rows~~ detected by a light beam receiving surface of the detecting device, is formed into a first writing position signal, which represents ~~on a photoconductor~~ of a scanning direction beam of the first row on a photoconductor, and wherein a second a writing position signal, which represents on the photoconductor of

Serial No. 10/085,583  
Docket No. H07-139239M/MAK

4

the scanning direction beam of a second ~~or subsequent~~ row on the photoconductor, is formed into a second writing position signal in which at least one of a delay and a ~~or~~ lead is provided so that a scanning direction writing position on the photoconductor of the second ~~or subsequent~~ row aligns with a scanning direction writing position of the first row on the photoconductor.

7. (Currently amended) A two-dimensional beam writing position detecting device, comprising:

an optical system for scanning on a photoconductor by laser beams emitted from a semiconductor laser to form an electrostatic latent image and arranging a plurality of the laser beams in two dimensions and slantingly scanning the plurality of laser beams for forming the electrostatic latent image on the photoconductor at a predetermined angle ( $\theta$ ); and

a detector for detecting the plurality of laser beams for determining a first writing position of the plurality of laser beams on the photoconductor,

wherein a signal, which represents ~~of~~ a scanning direction beam of a first row ~~or a~~ ~~plurality-th row~~ detected by a light beam receiving surface of the detecting device, is formed into a first writing position signal, which represents ~~on a photoconductor of~~ a scanning direction beam of the first row on a photoconductor, and

wherein a second a writing position signal, which represents ~~on the photoconductor of~~ the scanning direction beam of a second ~~or subsequent~~ row on the photoconductor, is formed into a second writing position signal in which at least one of a delay and a ~~or~~ lead is provided so that a scanning direction writing position on the photoconductor of the second ~~or subsequent~~ row aligns with a scanning direction writing position of the first row on the photoconductor.

Serial No. 10/085,583  
Docket No. H07-139239M/MAK

5

8. (Previously presented) An image forming apparatus wherein a two-dimensional beam writing position detecting device according to claim 1 is installed in a beam scanning position that is not on a scanning line of the photoconductor.

9. (Currently amended) An image forming apparatus wherein a two-dimensional beam writing position detecting device according to claim 2 [[1]] is installed in a beam scanning position that is not on a scanning line of the photoconductor.

10. (Previously presented) A two-dimensional beam writing position detecting device, comprising:

an optical system for scanning a plurality of light beams on a photoconductor to form an electrostatic latent image, arranging the plurality of light beams in two dimensions, and slantingly scanning the plurality of light beams for forming the electrostatic latent image on the photoconductor at a predetermined slant angle (  $\theta$  ) with respect to a scanning direction of the plurality of light beams; and

a detector for detecting the plurality of light beams for determining a first writing position of the plurality of light beams on the photoconductor, said detector comprising a light beam receiving surface,

wherein a longitudinal direction of the light beam receiving surface is disposed at an angle (  $\theta_1$  ) with respect to the scanning direction of the plurality of light beams, and

Serial No. 10/085,583  
Docket No. H07-139239M/MAK

6

wherein the angle ( $\theta_1$ ) is substantially equal to the predetermined slant scanning angle ( $\theta$ ) for simultaneously detecting the plurality of light beams in at least one dimension.

11. (Previously presented) The two-dimensional beam writing position detecting device according to claim 10, wherein said detector is disposed in a position of beam scanning that is not within a scanning width of the photoconductor.

12. (Previously presented) The two-dimensional beam writing position detecting device according to claim 10, wherein said detector comprises a high-speed PIN photodiode.

13. (Previously presented) The two-dimensional beam writing position detecting device according to claim 10, further comprising a print data control circuit for obtaining a writing signal of a scanning direction beam of a first row and a writing signal of a scanning direction beam of a second row.

14. (Previously presented) The two-dimensional beam writing position detecting device according to claim 10, further comprising a laser modulation circuit for aligning a writing position of a first row of a scanning direction beam on the photoconductor and a writing position of a second row of a scanning direction beam on the photoconductor in a sub-scanning direction of the photoconductor.

Serial No. 10/085,583  
Docket No. H07-139239M/MAK

7

15. (Currently amended) The two-dimensional beam writing position detecting device according to claim 13, wherein the print data control circuit comprises a ~~delay~~ circuit including at least one of a delay circuit and an advancing circuit.

16. (Currently amended) The two-dimensional beam writing position detecting device according to claim 15, wherein the ~~delay~~ circuit including at least one of a delay circuit and an advancing circuit obtains a delayed signal of the writing signal of the scanning direction beam of the second row.

17. (Currently amended) The two-dimensional beam writing position detecting device according to claim 15, wherein the ~~delay~~ circuit including at least one of a delay circuit and an advancing circuit obtains an advanced signal of the writing signal of the scanning direction beam of the second row.

18. (Currently amended) The two-dimensional beam writing position detecting device according to claim 16 ~~[[17]]~~, further comprising a laser modulation circuit for aligning a writing position of a first row of a scanning direction beam on the photoconductor and a writing position of a second row of a scanning direction beam on the photoconductor in a sub-scanning direction of the photoconductor based on the delayed signal.

19. (Previously presented) The two-dimensional beam writing position detecting device according to claim 17, further comprising a laser modulation circuit for aligning a writing

Serial No. 10/085,583  
Docket No. H07-139239M/MAK

8

position of a first row of a scanning direction beam on the photoconductor and a writing position of a second row of a scanning direction beam on the photoconductor in a sub-scanning direction of the photoconductor based on the advanced signal.

20. (Previously presented) A two-dimensional beam writing position detecting device, comprising:

an optical system for scanning a plurality of light beams on a photoconductor to form an electrostatic latent image, arranging the plurality of light beams in two dimensions, and slantingly scanning the plurality of light beams for forming the electrostatic latent image on the photoconductor at a predetermined slant angle ( $\theta$ ) with respect to a scanning direction of the plurality of light beams; and

a detector for detecting the plurality of light beams for determining a first writing position of the plurality of light beams on the photoconductor, said detector comprising a light beam receiving surface,

wherein a longitudinal direction of the light beam receiving surface is disposed at an angle ( $\theta_1$ ) with respect to the scanning direction of the plurality of light beams for simultaneously detecting the plurality of light beams, and

wherein the angle ( $\theta_1$ ) is represented by an expression:

$$\theta_1 = \theta \pm \tan^{-1} [\text{a beam radius} / (P_2 \times \text{a number of beams of a primary scanning direction})]$$

where  $P_2$  in the expression is a beam pitch of a sub-scanning direction.

Serial No. 10/085,583  
Docket No. H07-139239M/MAK

9

21. (Previously presented) The two-dimensional beam writing position detecting device according to claim 20, wherein a length S1 of a light beam sub-scanning direction of the light beam receiving surface of the detecting device is greater than or equal to a value in which a beam diameter is added to a value in which a beam pitch P2 of the sub-scanning direction is multiplied by [(a number of beams of the sub-scanning direction)-1], and a length S2 of a light beam scanning direction of the light beam receiving surface is less than [(a beam pitch P1 of the scanning direction)-(a beam diameter)].

22. (Previously presented) A two-dimensional beam writing position detecting device, comprising:

means for scanning on a photoconductor by laser beams emitted from a semiconductor laser to form an electrostatic latent image and arranging a plurality of the laser beams in two dimensions and slantingly scanning the plurality of laser beams for forming the electrostatic latent image on the photoconductor at a predetermined angle ( $\theta$ ); and

means for detecting the plurality of laser beams for determining a first writing position of the plurality of laser beams on the photoconductor,

wherein a longitudinal direction of a light beam receiving surface of the means for detecting inclines at the substantially same angle ( $\theta_1$ ) as the slant scanning angle ( $\theta$ ) with respect to the perpendicular of a scanning direction of the plurality of laser beams.



Serial No. 10/085,583

10

Docket No. H07-139239M/MAK

23. (Previously presented) A two-dimensional beam writing position detecting method, comprising:

scanning on a photoconductor by laser beams emitted from a semiconductor laser to form an electrostatic latent image and arranging a plurality of the laser beams in two dimensions and slantingly scanning the plurality of laser beams for forming the electrostatic latent image on the photoconductor at a predetermined angle ( $\theta$ ); and

detecting the plurality of laser beams for determining a first writing position of the plurality of laser beams on the photoconductor,

wherein a longitudinal direction of a light beam receiving surface of a detecting device inclines at the substantially same angle ( $\theta_1$ ) as the slant scanning angle ( $\theta$ ) with respect to the perpendicular of a scanning direction of the plurality of laser beams.